ABSTRACT OF THE DISCLOSURE

An optical recording/reproducing apparatus and method to determine a type of disk including a photodetector divided into at least two light receiving sections in a radial direction. A radial subtractor generates a radial push-pull signal from a difference between light receiving signals from a disk and received by the at least two light receiving sections, where the disk includes one of a first disk and a second disk. An upper envelope detector detects an upper envelope signal from the radial push-pull signal and a lower envelope detector detects a lower envelope signal from the radial push-pull signal. A phase comparator detects a phase difference between the upper envelope signal and the lower envelope signal. A type of disk determiner distinguishes the first disk from the second disk according to a magnitude of the phase difference and outputting a signal indicative thereof, where the second disk includes a density higher than the first disk. A servo error generator and servo controller receives the magnitude of the phase difference and the light receiving signals and outputting servo error signals. A servo driver amplifier receives the servo error signals to output a voltage to drive a spindle motor of the disk. Furthermore, a first track cross signal generator generates a first track cross signal from an envelope of an RF SUM signal, wherein the RF SUM signal is obtained by adding the light receiving signals. A second track cross signal generator generates a second track cross signal from an envelope of the radial push-pull signal. A switch selectively outputs one of the first track cross signal and the second track cross signal according to the output signal from the type of disk determiner.